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U.S. COURT OF APPEALS  
FOR THE FEDERAL CIRCUIT

**United States Court of Appeals for the Federal Circuit**

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2007-1302, -1303, -1304

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O2 MICRO INTERNATIONAL LIMITED,

BY Plaintiff-Appellee,

v.

BEYOND INNOVATION TECHNOLOGY CO., LTD.,

Defendant-Appellant,

and

FSP GROUP and SPI ELECTRONIC CO., LTD.,

Defendants-Appellants,

and

LIEN CHANG ELECTRONIC ENTERPRISE CO., LTD.,

Defendant-Appellant

James Pooley, Morrison & Foerster LLP, of Palo Alto, California, argued for plaintiff-appellee. With him on the brief was Bryan Wilson. Of counsel on the brief was Richard S.J. Hung, of San Francisco, California. Of counsel were Duane H. Mathiowetz, Howrey LLP, of San Francisco, California; and Richard C. Lin and Henry C. Su, of East Palo Alto, California.

Stanley Young, Heller Ehrman LLP, of Menlo Park, California, argued for defendant-appellant Beyond Innovation Technology Co., Ltd. With him on the brief was Sarah R. Houghland. Of counsel on the brief were Johnny Cheng-Teh Chiu, of Washington, DC; E. Joshua Rosenkranz, of New York, New York; and Ethan C. Glass, of San Francisco, California.

Gregory W. Carr, Carr LLP, of Dallas, Texas, for defendants-appellants FSP Group and SPI Electronic Co., Ltd. With him on the brief was Theodore F. Shiells.

Mao-Sen Yieh, Law Offices of Mao-Sen Yieh, of Houston, Texas, for defendant-appellant Lien Chang Electronic Enterprise Co., Ltd.

Appealed from: United States District Court for the Eastern District of Texas

Judge T. John Ward



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Appeals from the United States District Court for the Eastern District of Texas in case no 2:04-CV-32, Judge T. John Ward.

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DECIDED: April 3, 2008

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Before LOURIE, Circuit Judge, CLEVENGER, Senior Circuit Judge, and PROST, Circuit Judge

PROST, Circuit Judge.

Defendants-Appellants Beyond Innovation Technology Company Limited ("BiTEK"), SPI Electronic Company Limited and FSP Group (collectively, "SPI/FSP"), and Lien Chang Electronic Enterprise Company Limited ("Lien Chang") appeal a final

judgment by the United States District Court for the Eastern District of Texas. O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co., No. 2:04-CV-32 (E.D. Tex. Mar. 21, 2007). A jury found that Defendants-Appellants willfully induced the infringement of claims 1, 15, 35, and 39 of U.S. Patent No. 6,259,615 ("the '615 patent"), claims 12 and 16 of U.S. Patent No. 6,396,722 ("the '722 patent"), and claims 13, 16, and 17 of U.S. Patent No. 6,804,129 ("the '129 patent"), all of which are owned by Plaintiff-Appellee O2 Micro International Ltd. ("O2 Micro"). The district court entered a final judgment and permanent injunction. For the reasons explained below, we vacate and remand for further proceedings.

## I BACKGROUND

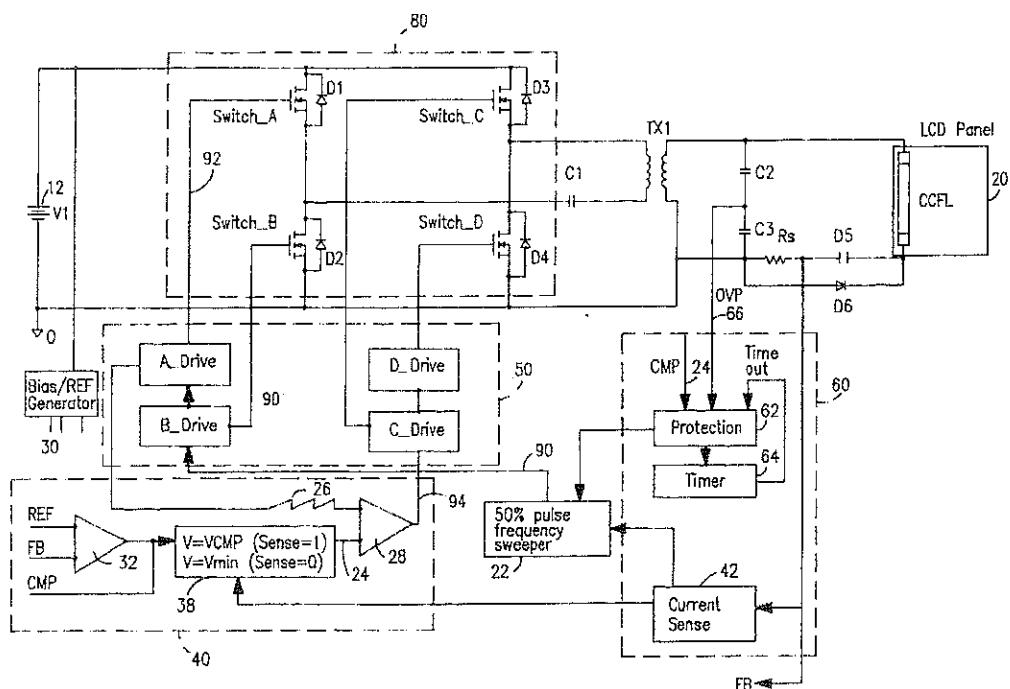
### A. Patents-in-Suit

The patents-in-suit<sup>1</sup> are directed to DC-to-AC converter circuits, which convert low voltage direct current ("DC") into higher voltage alternating current ("AC"). Also called inverter controllers, these circuits may be used to control the amount of power delivered to cold cathode fluorescent lamps ("CCFLs") that are used to backlight the screens of laptop computers and televisions. When powered by a battery or other DC power source, a CCFL uses a DC-to-AC converter circuit because CCFLs are designed to run on AC power. The patents-in-suit describe a converter circuit that employs a feedback control loop to control the amount of power delivered from the DC power source (the "drive") to the CCFL (the "load").

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<sup>1</sup> The patents-in-suit are related—the '129 patent is a continuation of a continuation of the '722 patent, which is a continuation of the '615 patent—and share a common specification. For simplicity, we refer to the disclosure of the '615 patent and omit the parallel citations to the '722 patent and the '129 patent.

As shown in Figure 2 of the '615 patent, the converter circuit includes a number of switches (80) placed between the drive (12) and the load (20). Drive circuitry (50) associated with each switch determines when and how long a given switch will be turned on ("ON time"). If a pair of switches along a conduction path are ON simultaneously, the circuit will deliver more power to the load. Thus, by adjusting the overlap between switches' ON times, the circuit can precisely control the amount of power delivered to the load.



'615 patent's Figure 2

The converter circuit uses a feedback control loop (40) to affect the switches' ON times. To the feedback control loop, the converter circuit provides a feedback signal (FB) indicative of the total current (and, thus, power) at the load and a reference voltage (REF) indicative of the desired load conditions (for example, the desired total current at the load). An error amplifier (32) compares the feedback signal (FB) and the reference voltage (REF) to produce a comparison signal (CMP). During normal operation, the

drive circuitry (50) receives the comparison signal (94) and may use it to adjust the switches' ON times, thereby regulating the power to the load

To protect the circuitry from damage during an open-circuit condition (such as when a CCFL breaks or becomes disconnected), the feedback signal (FB) may also be compared to a reference value (not shown in Figure 2) at the current sense comparator (42). This reference value preferably reflects the minimum or maximum current permitted by the system. Thus, when the value of the feedback signal (FB) is within a permitted range (i.e., during normal operation), the current sense comparator (42) allows the comparison signal (CMP) to flow through switch 38; however, when the value of the feedback signal is outside that range (e.g., during an open circuit or short circuit condition), the current sense comparator substitutes a minimum voltage (Vmin) for the comparison signal (CMP) at switch 38. In the latter case, the minimum voltage minimizes the overlap of the switches' ON times, reducing the power to a safer level while avoiding shutdown if the lamp remains operable.

During prosecution of the application, the examiner rejected the '615 patent under 35 U.S.C. § 103 as unpatentable over a combination of U.S. Patent No. 5,384,516 to Kawabata ("Kawabata") and U.S. Patent No. 6,011,360 to Gradzki ("Gradzki"). The examiner observed that the feedback loop described in the originally filed claims was obvious, stating that "Gradzki et al. teaches the utilization of the technique for a feedback loop circuit between the load and the drive circuitry supplying a feedback signal indicative of power being supplied to the load" JA 7638. The examiner found that, like the application's pending claims, Gradzki discloses an inverter controller that regulates lamp power irrespective of the level of the feedback signal.

In response to the examiner's rejection, O2 Micro added a limitation to each of the independent claims. Specifically, O2 Micro amended Claim 1 of the '615 patent to require that the feedback control loop circuit control the conduction state of the switches "only if said feedback signal is above a predetermined threshold" (the "only if" limitation). O2 Micro provided little explanation for the amendment, stating that "[i]n contrast to [the prior art], Applicant's invention of independent claim 1 requires, inter alia, a DC/AC converter circuit that includes a feedback control loop circuit . . . adapted to generate a second pulse signal only if said feedback signal is above a predetermined threshold." J.A. 7626. After receiving this amendment, the examiner issued a notice of allowance.

Claim 1 of the '615 patent is representative of the asserted claims for the issues presented by this appeal. As issued, it requires, in relevant part, a DC/AC converter circuit comprising:

a feedback control loop circuit receiving a feedback signal indicative of power being supplied to said load, and adapted to generate a second signal pulse signal for controlling the conduction state of said second plurality of switches only if said feedback signal is above a predetermined threshold;

'615 patent col.10 l.67 – col.11 l.5.

## B Accused Devices

BiTEK manufactures and sells inverter controllers SPI/FSP and Lien Chang manufacture and sell inverter modules incorporating BiTEK's inverter controllers. O2 Micro alleged that four of BiTEK's products (BIT3105, BIT3106, BIT3107 and BIT3193) infringe one or more of the patents-in-suit. The parties concede that, for the purposes of this litigation, the first three products (BIT3105, BIT3106, and BIT3107) are the same, and the fourth (BIT3193) differs from the others in only one material respect.

BiTEK's inverter controllers have feedback control loops. The controllers are capable of shutting off the feedback signal's control over power when a feedback signal falls below a predetermined threshold. The parties dispute whether this feature satisfies the "only if" limitation recited by the asserted claims, which requires "a feedback control loop circuit . . . adapted to generate a second signal pulse signal for controlling . . . [the] switches only if said feedback signal is above a predetermined threshold" (emphasis added)

BiTEK submits that its inverter controllers do not satisfy this limitation in two circumstances because, during those circumstances, the feedback signal in BiTEK's switch continues to control the power delivered to the load even though the feedback signal falls below the predetermined threshold. The first circumstance is when an unlit lamp lights up (called "start-up" or "ignition") BiTEK asserts that, during the ignition period, the feedback signal is below the predetermined threshold, but the feedback circuit still controls power delivered to the load, in violation of the claims' requirements. This first circumstance applies to all four products. The second circumstance applies only to the BIT3193 product, which implements a 32-microsecond delay. During this delay period, the feedback circuit is designed to continue to rely on the feedback signal to control the power for 32 microseconds after the feedback signal falls below the predetermined threshold. Such a delay was purposely created to ensure that the feedback signal would not cease to control the power to the load because of a temporary fall below the threshold.

On appeal, BiTEK relies exclusively on these two circumstances to avoid infringement under the claim, asserting that the "only if" limitation is therefore not

satisfied O2 Micro, on the other hand, asserts that this limitation is satisfied by the accused devices First, O2 Micro argues that the claims do not apply in the two circumstances identified by BiTEK. Second, O2 Micro disputes BiTEK's allegations regarding the operation of its devices during those circumstances and, consequently, asserts that, even if the claims apply, the accused devices still infringe.

### C. District Court Proceedings

In January 2004, O2 Micro filed suit against BiTEK, SPI/FSP, and Lien Chang in the United States District Court for the Eastern District of Texas. O2 Micro alleges that BiTEK's inverter controllers infringe several claims of the '615 patent, the '722 patent, and the '129 patent. While Defendants-Appellants are foreign entities that operate abroad, Defendants-Appellants' inverter controllers and modules are used in monitors sold in the United States.

The district court held a Markman hearing in August 2005. The parties agreed, for the most part, that a previously issued claim construction order (from a different case pending before the same court) controlled in this case. See O2 Micro Int'l Ltd. v. Sumida Corp., 2:03-CV-07 (E.D. Tex. Mar. 8, 2005) (claim construction order construing claim language in the same patents). However, the parties presented a handful of additional terms for the court to construe. The claim term "only if" (one of the additional terms disputed by the parties) is the only term whose construction was appealed to this court.

At the Markman hearing, Defendants-Appellants argued that the district court should construe the claim term "only if," but disagreed regarding what specific meaning should be ascribed to it. Defendants-Appellants BiTEK and Lien Chen asserted that

"only if" should mean "exclusively or solely in the event that," while defendant SPI/FSP asserted that it should mean "never except when." In spite of the differences in word choice, Defendants-Appellants seemed to agree that these constructions are substantially identical in meaning O2 Micro, on the other hand, maintained that no construction was necessary because the claim term "only if" consists of "two simple, plain English words." During the hearing, the district court astutely summarized the dispute as concerning whether or not "there can be an exception" to the "only if" language. However, in its Markman order, the district court ruled that this term "needs no construction" because it "has a well-understood definition, capable of application by both the jury and this court in considering the evidence submitted in support of an infringement or invalidity case" O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co., No. 2:04-CV-32 (E.D Tex. Aug. 26, 2005)

During pre-trial proceedings, BiTEK filed a motion in limine seeking to prevent O2 Micro from alleging infringement under the doctrine of equivalents as to the "only if" limitation, asserting that prosecution history estoppel barred that theory. The district court originally granted this motion, instructing O2 Micro to first approach the bench before "offering any evidence relating to infringement of the 'only if' limitation under the doctrine of equivalents" O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co., No. 2:04-CV-32 (E.D Tex May 2, 2006). However, after considering supplemental briefing, the district court changed course, ruling that O2 Micro was allowed to argue that the "only if" limitation is infringed under the doctrine of equivalents O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co., No. 2:04-CV-32 (E.D Tex May 8, 2006). Without any analysis, the district court's opinion simply stated, "The court . . . is persuaded by O2's argument

that the amendment bears only a tangential relationship to the equivalent at issue " Id. (also citing Insituform Techs., Inc. v. CAT Contracting, Inc., 385 F.3d 1360, 1370 (Fed Cir 2004)).

At trial, the "only if" limitation was a key issue disputed by the parties. O2 Micro presented evidence that the accused devices satisfied the "only if" limitation both literally and under the doctrine of equivalents. Defendants-Appellants presented evidence to the contrary. Moreover, both parties presented arguments regarding whether or not the "only if" claim language allows exceptions.

After trial, the parties submitted proposed verdict forms that asked separate questions regarding literal infringement and infringement under the doctrine of equivalents. The district court generated a jury form containing general questions regarding "infringement" and included jury instructions explaining that a claim limitation may be satisfied either literally or under the doctrine of equivalents. After deliberations, the jury found that each Defendant-Appellant had induced infringement of each asserted claim of each patent. The jury also found that Lien Chang contributorily infringed and all three Defendants-Appellants willfully infringed. Defendants-Appellants timely appealed to this court. We have jurisdiction pursuant to 28 U.S.C. § 1295(a)(1).

## II. DISCUSSION

As noted above, the district court provided a general verdict form that asked the jury whether each defendant "infringe[d]" each of the asserted claims. The corresponding jury instructions explained that infringement may be found either literally or under the doctrine of equivalents. On appeal, Defendants-Appellants allege error in both theories of infringement liability. First, Defendants-Appellants contend that the

district court's failure to construe the claim term "only if" was legal error that infected the literal infringement inquiry. Second, Defendants-Appellants assert that the jury should not have been permitted to find infringement under the doctrine of equivalents. We address each of these arguments in turn.

#### A Claim Construction

With respect to literal infringement, the parties dispute whether the district court's failure to construe the claim term "only if" was legal error. As a threshold matter, however, O2 Micro argues that Defendants-Appellants waived any challenge to the construction of "only if" by: (1) failing to object to the jury instructions as lacking a construction of that claim term and (2) offering a different construction of the claim term on appeal than was presented to the district court. Before addressing the claim construction issue on the merits, we turn to these waiver arguments.

First, O2 Micro contends that Defendants-Appellants have waived any challenge to the construction of "only if" because Defendants-Appellants failed to object to the jury instructions as lacking a construction of that term. O2 Micro acknowledges that Defendants-Appellants presented these arguments during the Markman hearing and that the district court issued a claim construction order months before trial. O2 Micro asserts, however, that a party waives its objections to a claim construction by not objecting to the jury instructions containing (or, in this case, lacking) that construction.

In response, Defendants-Appellants argue that the purpose of a Markman hearing is to determine the meaning of claim terms. A claim construction order always dictates how the court will instruct the jury regarding a claim's scope. Because these issues were fully litigated and decided at the Markman stage of the litigation,

Defendants-Appellants assert that no objection to the jury instruction was required to preserve error. We agree.

"When the claim construction is resolved pre-trial, and the patentee presented the same position in the Markman proceeding as is now pressed, a further objection to the district court's pre-trial ruling may indeed have been not only futile but unnecessary" Cardiac Pacemakers, Inc. v. St. Jude Med., Inc., 381 F.3d 1371, 1381 (Fed. Cir. 2004) (under Seventh Circuit law). The same holds true in the Fifth Circuit Taita Chem. Co. v. Westlake Styrene, LP, 351 F.3d 663, 667 (5th Cir. 2003) (stating that there is no need to object where a litigant "had previously filed sufficient objections"); Rizzo v. Children's World Learning Ctrs., Inc., 213 F.3d 209, 223 (5th Cir. 2000) ("Failure to object [to a proposed jury instruction] may be disregarded if the party's position has previously been made clear to the court and it is plain that a further objection would have been unavailing."); Bender v. Brumley, 1 F.3d 271, 277 (5th Cir. 1993) (finding "oral on-the-record objections to the jury charge" were not required to preserve objection where appellant "had earlier filed written objections to the proffered jury instructions"). The district court in this case, as in Cardiac Pacemakers, rendered a claim construction order following a Markman hearing during which the parties' positions were fully litigated. Because Defendants-Appellants' position was previously made clear to the district court and the district court did not clearly indicate that it was open to changing its claim construction, Defendants-Appellants need not have renewed their objections by reasserting them when jury instructions were given.

Second, O2 Micro also asserts that Defendants-Appellants have waived their proposed claim constructions of "only if" by asserting a new construction on appeal.

Contending that Defendants-Appellants' current construction is that "only if" allows for "no exceptions," O2 Micro notes that the word "exception" was never used in Defendants-Appellants' claim construction briefs. Defendants-Appellants respond by re-affirming the construction proposed to the district court—namely, "only if" means "solely or exclusively in the event that." Defendants-Appellants argue that, while the arguments advanced in support of their construction may have changed, the construction itself remains the same. Defendants-Appellants note that these new arguments simply recognize that the effect of their proposed construction is to prohibit exceptions to the "only if" limitation.

We agree with Defendants-Appellants that no waiver has occurred. While "a waiver may occur if a party raises a new issue on appeal . . . [a] waiver will not necessarily occur . . . if a party simply presented new or additional arguments in support of 'the scope of its claim construction . . .'" CCS Fitness, Inc. v. Brunswick Corp., 288 F.3d 1359, 1370-71 (Fed. Cir. 2002) (citation omitted). Defendants-Appellants propose the same construction on appeal as was presented to the district court. While Defendants-Appellants employ different arguments in support, these new arguments simply incorporate an understanding of the parties' dispute that has developed through the course of litigation. At the claim construction hearing, the district court astutely recognized that the dispute "boils down to whether [the court] believe[s] there can be an exception." Thus, we conclude Defendants-Appellants have not waived these arguments.

Accordingly, we turn to the merits of Defendants-Appellants' appeal of the district court's failure to construe the claim term "only if." On appeal, Defendants-Appellants

argue that the district court's failure to construe the claim term "only if" was error because the parties disputed whether or not this claim language allows for exceptions. Defendants-Appellants assert that, because this presents an issue of claim construction, it is a question of law that must be decided by the court. In Defendants-Appellants' view, by failing to provide a construction of this term, the district court effectively submitted a legal question to the jury. Defendants-Appellants also argue that the district court erred by allowing the jury to reach a verdict based upon an erroneous legal conclusion—namely, that "only if" allows exceptions.

O2 Micro counters that the claim term "only if" does not need to be construed because the parties agree that the term is a "common term" with a "common meaning." O2 Micro notes that this court has repeatedly held that a district court is not obligated to construe terms with ordinary meanings,<sup>2</sup> lest trial courts be inundated with requests to parse the meaning of every word in the asserted claims.

The purpose of claim construction is to "determin[e] the meaning and scope of the patent claims asserted to be infringed" Markman v. Westview Instruments, Inc., 52 F.3d 967, 976 (Fed. Cir. 1995) (en banc), aff'd 517 U.S. 370 (1996). When the parties raise an actual dispute regarding the proper scope of these claims, the court, not the jury, must resolve that dispute. See id. at 979 (holding that claim construction is a matter of law)

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<sup>2</sup> E.g., Biotec Biologische Naturverpackungen GmbH & Co. KG v. Biocorp, Inc., 249 F.3d 1341, 1349 (Fed. Cir. 2001) (finding no error in non-construction of "melting"); Mentor H/S, Inc. v. Med. Device Alliance, Inc., 244 F.3d 1365, 1380 (Fed. Cir. 2001) (finding no error in court's refusal to construe "irrigating" and "frictional heat")

Words of a claim are generally given their ordinary and customary meaning, which is the meaning a term would have to a person of ordinary skill in the art after reviewing the intrinsic record at the time of the invention. Phillips v. AWH Corp., 415 F.3d 1303, 1312-13 (Fed. Cir. 2005) (en banc). “In some cases, the ordinary meaning of claim language . . . may be readily apparent even to lay judges, and claim construction in such cases involves little more than the application of the widely accepted meaning of commonly understood words” Id. at 1314. However, in many cases, the meaning of a claim term as understood by persons of skill in the art is not readily apparent Id.

In this case, the parties dispute whether or not the “only if” limitation allows for exceptions. O2 Micro asserts that the claims would be understood by one of ordinary skill in the art to only apply to “the steady state operation of the switching circuit.” Defendants-Appellants disagree and submit that the claims apply at all times—not just to steady state operation—with no exceptions. There are two circumstances in which Defendants-Appellants assert that the “only if” limitation is not satisfied: (1) the pre-ignition, start-up phase, and (2) a 32-microsecond delay. Accordingly, Defendants-Appellants seek a construction that specifies that “only if” has no exceptions and is not limited to “steady state operation.”

During the claim construction hearing, the district court acknowledged that this dispute over the scope of the asserted claims “boils down to whether I believe there can be an exception.” However, the district court declined to construe this term, stating:

The term “only if” needs no construction aside from the construction previously adopted by the court for the phrases in which the term appears. It is true, as defendants argue, that Elekta Instruments, S.A. v. O.U.R. Scientific International, Inc., 214 F.3d 1302 (Fed. Cir. 2000), applies the

ordinary meaning of "only" (being solely; exclusively) to a claim term and evaluates the evidence in that light. Nothing in Elekta Instruments, however, requires the court to construe claim terms that have a well-understood meaning. "Only if" has a well-understood definition, capable of application by both the jury and this court in considering the evidence submitted in support of an infringement or invalidity case.

O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co., No 2:04-CV-32, slip op. at 2 (E D Tex. Aug 26, 2005). We find this decision to be in error because, while Elekta Instruments may not require the court to construe this claim term, we find that Markman does

The parties presented a dispute to the district court regarding the scope of the asserted claims—What do the patents mean when they say that the feedback signal controls power "only if said feedback signal is above a predetermined threshold"? O2 Micro contends that this "only if" limitation only applies during "steady state operation," while Defendants-Appellants contend that the "only if" limitation applies at all times without exception. This dispute over the scope of the asserted claims is a question of law. In deciding that "only if" needs no construction" because the term has a "well-understood definition," the district court failed to resolve the parties' dispute because the parties disputed not the meaning of the words themselves, but the scope that should be encompassed by this claim language

A determination that a claim term "needs no construction" or has the "plain and ordinary meaning" may be inadequate when a term has more than one "ordinary" meaning or when reliance on a term's "ordinary" meaning does not resolve the parties' dispute. In this case, for example, the parties agreed that "only if" has a common meaning, but then proceeded to dispute the scope of that claim term, each party providing an argument identifying the alleged circumstances when the requirement

specified by the claim term must be satisfied (e.g., at all times or during steady state operation). In this case, the "ordinary" meaning of a term does not resolve the parties' dispute, and claim construction requires the court to determine what claim scope is appropriate in the context of the patents-in-suit. This court has construed other "ordinary" words for these and other related reasons. See, e.g., Nystrom v. TREX Co., 424 F.3d 1136, 1143 (Fed. Cir. 2005) (construing "board" in light of intrinsic record); Unitherm Food Sys., Inc. v. Swift-Eckrich, Inc., 375 F.3d 1341, 1350 (Fed. Cir. 2004) (construing "golden brown" even though colors "are commonly used terms with well-accepted plain definitions that rarely need construction"), rev'd on other grounds, 546 U.S. 394 (2006); Toro Co. v. White Consol. Indus., Inc., 199 F.3d 1295, 1299 (Fed. Cir. 1999) (construing "cover," "included," "attachment," and "removable").

When the district court failed to adjudicate the parties' dispute regarding the proper scope of "only if," the parties presented their arguments to the jury. By failing to construe this term, the district court left the jury free to consider these arguments. O2 Micro presented expert testimony to support its argument that the claim limitation "only if" applies only during certain periods of operation—"normal operation"—and that this claim limitation "has nothing to do with start-up." O2 Micro also brought the inventor of the patents-in-suit to testify regarding the meaning of "only if":

Q: What did the additional language, "only if said feedback signal is above a predetermined threshold," pertain to?

A: Actually, in my opinion, specification did not change. "Only if," between my patent lawyer and examiner, they added in to try to clarify, make the entire invention more easier to understand. I think that's what it is. To me, there's no change to my original invention's intent

Q: So if the only time it makes any sense to use feedback to control power to a lamp is after it's lit, after this threshold is reached, what did you give up, if anything, by adding the "only if" language to the claims?

A: I don't think I gave up anything I think it just make it clear that you and I can understand.

Only when the lamp is lit . . . we control power at that time.

J A. 6550-51 Likewise, Defendants-Appellants argued to the jury that "only if" does not allow for exceptions. For the reasons stated, the parties' arguments regarding the meaning and legal significance of the "only if" limitation were improperly submitted to the jury.<sup>3</sup>

We, however, recognize that district courts are not (and should not be) required to construe every limitation present in a patent's asserted claims. See, e.g., Biotec Biologische Naturverpackungen GmbH & Co. KG v. Biocorp, Inc., 249 F.3d 1341, 1349 (Fed Cir. 2001) (deciding that disputed issue was the proper application of a claim term to an accused process rather the scope of the term); U.S. Surgical Corp. v. Ethicon, Inc., 103 F.3d 1554, 1568 (Fed Cir. 1997) (Claim construction "is not an obligatory exercise in redundancy.") Rather, "[c]laim construction is a matter of resolution of disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered by the claims, for use in the determination of infringement." U.S.

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<sup>3</sup> We note, in passing, that the parties' claim construction arguments are fraught with problems. First, an inventor's self-serving statements are rarely relevant to the proper construction of a claim term. Bell & Howell Document Mgmt. Prods v. Altek Sys., 132 F.3d 701, 706 (Fed Cir. 1997). Second, the parties' claim construction arguments appear to contain no support from the intrinsic record. See Phillips, 415 F.3d at 1314-19 (emphasizing the importance of the intrinsic record in claim construction). These deficiencies support the rationale underlying the rule that the court, and not the jury, should resolve claim construction disputes. See Markman v. Westview Instruments, Inc., 517 U.S. 370, 388-89 (1996) (explaining why judges "are the better suited to find the acquired meaning of patent terms").

Surgical, 103 F 3d at 1568. When the parties present a fundamental dispute regarding the scope of a claim term, it is the court's duty to resolve it. Because we determine that the district court is in the best position to determine the proper construction of this claim term in the first instance, we remand for further proceedings consistent with this opinion.<sup>4</sup>

#### B. Doctrine of Equivalents

We turn now to Defendants-Appellants' arguments with respect to the doctrine of equivalents.<sup>5</sup> "The doctrine of equivalents allows the patentee to claim those insubstantial alterations that were not captured in drafting the original patent claim but which could be created through trivial changes." Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 535 U.S. 722, 733 (2002). However, when a patent claim is narrowed during prosecution, prosecution history estoppel may limit application of the doctrine of equivalents. Int'l Rectifier Corp. v. IXYS Corp., 515 F.3d 1353, 1358 (Fed. Cir. 2008) "[W]e review issues relating to the application of prosecution history

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<sup>4</sup> O2 Micro also argues that, if the failure to construe "only if" was error, it was not prejudicial error because O2 Micro presented evidence sufficient to prove literal infringement under the construction proposed by Defendants-Appellants. Defendants-Appellants, on the other hand, contend that a construction of "only if" would certainly have changed the result. We do not find the infringement evidence to be clearly in favor of either party, and cannot conclude that the lack of a construction did not result in harm.

<sup>5</sup> O2 Micro asserts that the jury verdict, which found "infringement," should not be vacated unless we find error in both theories of liability (i.e., literal infringement and infringement under the doctrine of equivalents). Under O2 Micro's theory, the jury verdict must be upheld if the jury could have found infringement under either theory because Defendants-Appellants failed to object to the district court's use of a general verdict form. Because we find error in both literal infringement and infringement under the doctrine of equivalents, we need not decide this issue.

estoppel de novo" Conoco, Inc. v. Energy & Envtl. Int'l, L.C., 460 F.3d 1349, 1357 (Fed Cir 2006)

On appeal, Defendants-Appellants argue that the district court erred in allowing the jury to find infringement under the doctrine of equivalents. Defendants-Appellants contend that, because the claim term "only if" was added during prosecution to overcome a prior art rejection, the Festo presumption should apply. According to Defendants-Appellants, because O2 Micro has failed to rebut this presumption, it should not have been allowed to argue that the accused devices infringe under the doctrine of equivalents. Accordingly, Defendants-Appellants find error in the jury instruction allowing for infringement under the doctrine of equivalents and O2 Micro's arguments at trial alleging infringement on this basis.

O2 Micro agrees that the addition of "only if" constituted a narrowing amendment made for a substantial reason relating to patentability. However, O2 Micro appears to offer two alternate theories for why Festo should not apply. At the district court, O2 Micro attempted to rebut the Festo presumption by arguing that the alleged equivalent is merely tangential to this amendment. On appeal, O2 Micro supplements this argument, asserting that the doctrine of equivalents should presumptively be available for other claim terms (namely, "feedback signal" and "adjustment") because these terms were not added by amendment.

We agree with Defendants-Appellants that prosecution history estoppel prevents application of the doctrine of equivalents for the "only if" limitation. The parties agree that the "only if" limitation was added to the claims by a "narrowing amendment . . . made for a substantial reason relating to patentability." See Festo Corp. v. Shoketsu

Kinzoku Kogyo Kabushiki Co., 344 F 3d 1359, 1367 (Fed Cir 2003) (en banc). Thus, the Festo presumption applies to this limitation, and, in order to avail itself of the doctrine of equivalents, O2 Micro must rebut the "presumption that the patentee has surrendered all territory between the original claim limitation and the amended claim limitation" Id.; accord Festo, 535 U.S. at 740 ("[T]he patentee should bear the burden of showing that the amendment does not surrender the particular equivalent in question"). The Supreme Court provided three vehicles<sup>6</sup> through which a plaintiff may do so. Festo, 344 F 3d at 1368. Neither party has argued either that the equivalent was unforeseeable or that there was "some other reason" why the patentee could not have described the alleged equivalent. See id. Accordingly, we turn directly to the issue of whether the rationale behind the narrowing amendment was merely tangential (i.e., peripheral, or not directly relevant) to the alleged equivalent. See id.

"[T]he inquiry into whether a patentee can rebut the Festo presumption under the 'tangential' criterion focuses on the patentee's objectively apparent reason for the narrowing amendment." Id. at 1369 (emphasis added). In order to maintain the public notice function of a patent, "that reason should be discernible from the prosecution history record." Id.; see id. at 1371-72 (holding that amendment was not tangential to accused equivalent because the prosecution history reveals no reason for the amendment); Biagro W. Sales, Inc. v. Grow More, Inc., 423 F 3d 1296, 1306 (Fed. Cir.

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<sup>6</sup> The three vehicles are: "(1) 'the alleged equivalent would have been unforeseeable at the time . . . the narrowing amendment' was made; (2) 'the rationale underlying the narrowing amendment bore no more than a tangential relation to the equivalent' at issue; and (3) 'there was "some other reason" suggesting that the patentee could not reasonably have been expected to have described the alleged equivalent.'" Honeywell Int'l Inc. v. Hamilton Sundstrand Corp., 370 F 3d 1131, 1140 (Fed. Cir. 2004) (quoting Festo, 344 F 3d at 1368).

2005) ("[W]hether the patentee has overcome the presumption on this ground is determined by the court on the basis of the public record."). "[I]f the patentee fails to rebut the Festo presumption, then prosecution history estoppel bars the patentee from relying on the doctrine of equivalents for the accused element." Festo, 344 F.3d at 1367

In ruling that the doctrine of equivalents was available with respect to the "only if" limitation, the district court simply stated that it was "persuaded by O2's argument that the amendment bears only a tangential relationship to the equivalent at issue" O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co., No. 2:04-CV-32 (E.D. Tex. May 8, 2006). Without the benefit of the district court's explanation of its rationale, we examine the prosecution history and parties' arguments to the district court.

During prosecution, the examiner rejected the '615 patent as obvious in light of Gradzki. Gradzki discloses an inverter controller that regulates lamp power irrespective of the level of the feedback signal. In response to the examiner's rejection, O2 Micro added the "only if" language to the independent claims, amending claim 1 of the '615 patent, for example, to require that the feedback control loop circuit controls the conduction state of the switches "only if said feedback signal is above a predetermined threshold." O2 Micro provided little explanation for the amendment, merely stating:

[T]he Examiner looks to Gradzki et al as disclosing a feedback technique to generate a feedback signal indicative of power being supplied to the load. Significantly, however, Gradzki et al. discloses a feedback system, maintains [sic] the voltage at the CRECT pin equal to the voltage at the DIN pin, thereby regulating lamp power (Gradzki et al., column 4, lines 64-67)

In contrast to [the prior art], Applicant's invention of independent claim 1 requires, inter alia, a DC/AC converter circuit that includes a feedback control loop circuit between the load and the drive circuitry receiving a feedback signal indicative of power supplied to the load and

adapted to generate a second pulse signal for controlling the conduction state of a second plurality of switches only if said feedback signal is above a predetermined threshold. Applicant's invention of independent claim 18 has been similarly amended.

J A. 7626.

To begin, O2 Micro correctly notes that prosecution history estoppel is a "flexible" doctrine, not a "rigid" one. See Festo, 535 U.S. at 738. O2 Micro then asserts that "the 'only if' language distinguished Gradzki by claiming a feedback system responsive to the feedback signal's being above or below a predetermined threshold," which is tangential to whether or not the feedback signal is used during "ignition of the lamp" and other non-steady state operations. Essentially, O2 Micro argues that exceptions to the "only if" limitation (e.g., during non-steady state operations) are merely tangential to the limitation itself. We find this argument to be without merit. The "objectively apparent" reason for the patentee's amendment was to require the feedback circuit to be operational "only if said feedback signal is above a predetermined threshold," as the claim language clearly states. No other reason is provided or suggested by the prosecution history. The equivalent alleged by O2 Micro is a feedback circuit that, during non-steady state operations, may be operational even though the claim language is not satisfied (i.e., the feedback signal is not above the predetermined threshold). This equivalent is simply not tangential to the reason for the amendment. Thus, it was error for the district court to allow the jury to consider infringement under the doctrine of equivalents.

On appeal, O2 Micro supplements its argument supporting the doctrine of equivalents instruction by asserting that the instruction was proper because the jury could have found that other claim terms were infringed by the doctrine of equivalents.

Noting that the terms "feedback signal" and "adjustment" were present in the originally filed claims, O2 Micro argues that its expert's equivalents analysis focused on these terms, not the "only if" claim language. O2 Micro also alleges that the doctrine of equivalents instruction would not be error so long as the jury could have found any limitation to be met by equivalents.

The record, however, does not support this argument. The district court's equivalents ruling focused on "only if," not "feedback signal" or "adjustment." Defendants-Appellants original motion in limine sought to prevent O2 Micro from arguing equivalents to "only if." The district court's decisions recognize that this was the claim term at issue for the purposes of these discussions. At trial, O2 Micro asked its expert, Dr. Rhyne: "[D]o the 'only if' limitations also infringe under the doctrine of equivalents?" J.A. 6328. In response, Dr. Rhyne explained why the reaction of the circuit was "essentially the same as it would be even if the feedback were not present" Id.

O2 Micro points to no portion of the record where it argued that the accused devices satisfied the "feedback signal" or "adjustment" limitations under the doctrine of equivalents. In O2 Micro's brief, it asserts that only three pages of trial testimony directly addressed the issue of equivalents; however, in these pages, O2 Micro's expert opines that the asserted equivalents are insubstantially different from the "only if" limitation, with no discussion regarding either "feedback signal" or "adjustment." While O2 Micro points to two additional excerpts of the trial transcript, the generalized testimony regarding "virtually insignificant" current flow is insufficient to establish that either the "feedback signal" or "adjustment" limitations were infringed under the doctrine

of equivalents. See Warner-Jenkinson Co. v. Hilton Davis Chem. Co., 520 U.S. 17, 29 (1997) ("[T]he doctrine of equivalents must be applied to individual elements of the claim, not to the invention as a whole"); Tex. Instruments, Inc. v. Cypress Semiconductor Corp., 90 F.3d 1558, 1567 (Fed Cir. 1996) ("Generalized testimony as to the overall similarity between the claims and the accused infringer's product or process will not suffice [to prove infringement under the doctrine of equivalents].").

Accordingly, we agree with Defendants-Appellants that the district court erred in allowing the jury to find infringement under the doctrine of equivalents. Because we vacate the jury verdict, the remaining issues raised by Defendants-Appellants (which are premised on that jury verdict) are rendered moot.

### III CONCLUSION

For the above reasons, we vacate the jury verdict, the final judgment of infringement, and the permanent injunction, and we remand to the district court for further proceedings consistent with this opinion.

### COSTS

Each party shall bear its own costs

VACATED AND REMANDED